

DEPARTMENT OF ~~LICENSING AND REGULATORY AFFAIRS~~ **LABOR AND
ECONOMIC OPPORTUNITY**

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY AND HEALTH STANDARD

Filed with the secretary of state on

These rules take effect immediately upon filing with the secretary of state unless adopted under section 33, 44, or 45a(6) of the administrative procedures act of 1969, 1969 PA 306, MCL 24.233, 24.244, or 24.245a. Rules adopted under these sections become effective 7 days after filing with the secretary of state.

(By authority conferred on the director of the department of ~~licensing and regulatory affairs~~ **labor and economic opportunity** by sections 19 and 21 of **the Michigan occupational safety and health act**, 1974 PA 154, MCL 408.1019 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, ~~and 2011-4~~, **and 2019-3**, MCL 445.2001, 445.2011, 445.2025, ~~and 445.2030~~, **and 125.1998**)

R 408.41410, R 408.41461, R 408.41467, R 408.41475a, R 408.41477 and R 408.41478 of the Michigan Administrative Code are amended, as follows:

PART 14. TUNNELS, SHAFTS, CAISSONS, AND COFFERDAMS

R 408.41410 Adoption of standards by reference.

Rule 1410. (1) The following standards are adopted by reference in these rules and are available from the U.S. Government Printing Office Bookstore, 710 North Capitol Street N.W., Washington, DC, at the toll-free telephone number: 866-542-1800 or via the internet at website: www.ecfr.gov at no cost as of the time of adoption of these rules:

(a) The provisions of 30 CFR, Mineral Resources Parts 1 to 199 "Mine Safety and Health Administration, Department of Labor," revised July 1, 2000.

(b) The provisions of 42 CFR, Public Health, Part 84 "Approval of Respiratory Protective Devices," revised October 1, 2001.

~~(2) The Bureau of Construction Codes, Elevator Safety Board 1967 PA 227, MCL 408.801 to 408.824 and R 408.8511 to R 408.8524 are referenced in these rules and are available from the Michigan Department of Licensing and Regulatory Affairs, Bureau of Construction Codes, Elevator Safety Division, P.O. Box 30255, Lansing, Michigan 48909, or via the internet at web site: www.michigan.gov/bcc, at no cost as of the time of adoption of these rules.~~

~~(3)~~**(2)** The standards adopted in subrule (1) of this rule ~~and referenced in subrule (2) of this rule~~ **are** available for inspection at the Department of ~~Licensing and Regulatory Affairs~~ **Labor and Economic Opportunity**, MIOSHA, Standards ~~and FOIA~~ Section, ~~7150 Harris Drive~~ **530 West Allegan Street, P.O. Box 30643**, Lansing, Michigan, 48909-8143.

January 1, 2021

~~(4)~~**(3)** Copies of the standards adopted in subrule (1) of this rule may be obtained from the publisher or may also be obtained from the Department of ~~Licensing and Regulatory Affairs~~**Labor and Economic Opportunity**, MIOSHA, Standards **and FOIA** Section, ~~7150 Harris Drive~~**530 West Allegan Street, P.O. Box 30643**, Lansing, Michigan, 48909-8143, at the cost charged in this rule, plus \$20.00 for shipping and handling.

~~(5)~~**(4)** The following Michigan occupational safety and health administration (MIOSHA) standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of ~~Licensing and Regulatory Affairs~~**Labor and Economic Opportunity**, MIOSHA, Standards **and FOIA** Section, ~~7150 Harris Drive~~**530 West Allegan Street, P.O. Box 30643**, Lansing, Michigan, 48909-8143; or via the internet at the following website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, as of the time of the adoption of these rules, is 4 cents per page.

(a) Construction Safety **and Health** Standard Part 1. “General Rules,” R 408.40101 to R 408.40134.

(b) Construction Safety Standard Part 7. “Welding and Cutting,” R 408.40701 to R 408.40762.

(c) Construction Safety Standard Part 9. “Excavation, Trenching, and Shoring,” R 408.40901 to R 408.40953.

(d) Construction Safety **and Health** Standard Part 10. “**Cranes and Derricks**,” R 408.41001 to R 408.41099a.

(e) Construction Safety Standard Part 16. “Power Transmission and Distribution,” R 408.41601 to R 408.41658.

(f) Construction Safety Standard Part 17. “Electrical Installations,” R 408.41701 to R 408.41734.

(g) Construction Safety Standard Part 18. “Fire Protection and Prevention,” R 408.41801 to R 408.41884.

(h) Construction Safety **and Health** Standard Part 21. “Guarding of Walking and Working Areas,” R 408.42101 to R 408.42160.

(i) Construction Safety **and Health** Standard Part 22. “Signals, Signs, Tags, and Barricades,” R 408.42201 to R **408.42243**.

(j) Construction Safety Standard Part 27. “Blasting and Use of Explosives,” R 408.42701 to R 408.42799.

(k) Construction Safety Standard Part 45. “Fall Protection,” R 408.44501 to R 408.44502.

~~(l) Occupational Health~~**General Industry and Construction Safety and Health** Standard Part 451. “Respiratory Protection,” R 325.60051 to R 325.60052.

~~(m) Occupational Health~~**Construction Safety and Health** Standard Part 665. “Underground Construction, Caissons, Cofferdams, and Compressed Air,” R 325.62991 to R 325.62996.

R 408.41461 Advance notice of tunnel excavation.

Rule 1461. (1) Before the start of a pressurized tunnel being constructed, modified, or repaired, that is 24 inches or more in diameter, height, or width, and that will be occupied by an employee, a report prepared by the employer performing the tunnel

excavation shall be sent to the Michigan Department of ~~Licensing and Regulatory Affairs~~**Labor and Economic Opportunity**, Construction Safety and Health Division, 530 West Allegan Street, P.O. Box 30645, Lansing, Michigan 48909-8145, in addition to the following civil authorities in the area: hospital, police department, fire department, and sheriff department. The report shall contain all of the following information:

- (a) Name of contractor or contractors.
- (b) Starting date.
- (c) Length of tunnel.
- (d) Diameter of cut.
- (e) Finished diameter.
- (f) Number of shafts.
- (g) Depth of shafts.
- (h) Location of shafts.
- (i) Method of tunneling.
- (j) Maximum working pressure in tunnel or shaft.
- (k) Type of primary liner.
- (l) Number of shifts.
- (m) Projected completion date.
- (n) Projected maximum work force within tunnel.

(2) An employer shall notify parties notified pursuant to subrule (1) of this rule when the work has been completed.

(3) If, after the start of any tunnel project, a tunnel or shaft that the employer has shown to be constructed, modified, or repaired under atmospheric conditions requires the tunnel to be pressurized, then the employer shall notify the Construction Safety and Health Division at the Michigan Department of ~~Licensing and Regulatory Affairs~~**Labor and Economic Opportunity**, 530 West Allegan Street, P.O. Box 30645, Lansing, Michigan 48909-8145, 24 hours before allowing employees to enter the tunnel.

(4) If the work operations of any occupied and pressurized tunnel projects are discontinued for 30 consecutive days or longer, then the employer shall notify the Construction Safety and Health Division at the Michigan Department of ~~Licensing and Regulatory Affairs~~**Labor and Economic Opportunity**, 24 hours before resuming work operations on the tunnel project.

R 408.41467 Fire prevention and protection.

Rule 1467. (1) The applicable requirements for fire prevention and protection as prescribed in Construction Safety Standard Part 18. "Fire Prevention and Protection," as referenced in R 408.41410, shall be complied with in all tunnel and shaft operations.

(2) Smoking and open flames are prohibited. An employer is responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons. Welding and cutting, where required, shall comply with the provisions of subrules (9) to (14) of this rule. A fire watch shall be maintained when hot work is performed.

(3) Not more than a 1-day supply of diesel fuel shall be stored in a tunnel or shaft. Gasoline or liquefied petroleum gas shall not be taken in a tunnel or shaft. Acetylene or methylacetylene propadiene stabilized gas may be used underground solely for welding, cutting, and other hot work and only as prescribed in Construction Safety Standard Part 7. "Welding and Cutting," as referenced in R 408.41410.

(4) The piping of diesel fuel from the surface to an underground location is permitted only if all of the following provisions are complied with:

(a) Diesel fuel is contained at the surface in a tank with a maximum capacity that is not more than the amount of fuel required to supply, for a 24-hour period, the equipment that is serviced by the underground fueling station.

(b) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is controlled at the surface by a valve and at the shaft bottom by a hose nozzle.

(c) The pipe is empty at all times, except when transferring diesel fuel from the surface tank to a piece of equipment in use underground.

(d) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(e) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting, and other hot work and only in accordance with subrules (9) to (14) of this rule.

(f) Not more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot work during the next 24-hour period shall be permitted underground.

(5) Leaks and spills of flammable or combustible fluids shall be cleaned up immediately.

(6) Oil, grease, or diesel fuel that is stored in a tunnel or shaft shall be kept in tightly sealed containers in fire-resistant areas at safe distances from explosives, magazines, electrical installations, and shaft stations. Electrical installations in underground areas where oil, grease, or diesel fuel are stored shall be used only for lighting fixtures. Lighting fixtures in storage areas, or within 25 feet (7.62 meters) of underground areas where oil, grease, or diesel fuel are stored, shall be approved for class I, division 2 locations.

(7) Fire-resistant hydraulic fluids shall be used in hydraulically actuated underground machinery and equipment. For the purpose of this requirement, a fire-resistant hydraulic fluid means any liquid which has a flash point above 200 degrees Fahrenheit and which has a vapor pressure of not more than 40 p.s.i. (absolute) at 100 degrees Fahrenheit.

(8) An approved 4A:40B:C rating fire extinguisher or equivalent protection shall be provided at the drive pulley of an underground conveyor and at 300-foot intervals along the belt. A minimum of 2 2A-10BC approved fire extinguishers shall be provided at the tunneling machine.

~~(9) All of the following are additional requirements for gassy operations:~~

~~-(a) Only acceptable equipment, maintained in suitable condition, shall be used in gassy operations.~~

~~-(b) Mobile diesel powered equipment used in gassy operations shall be either approved as prescribed in the requirements of 30 C.F.R. Part 36 "Mineral Resources," as adopted in R 408.41410 or shall be demonstrated by the employer to be fully equivalent to the mine safety and health administration approved equipment and shall be operated in accordance with that part.~~

~~-(c) Each entrance to a gassy operation shall be prominently posted with signs notifying all entrants of the gassy classification.~~

(9) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(10) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations:

(a) Shall comply with MSHA provisions in 30 CFR 57.5067; or

(b) If purchased on or before July 15, 2019, may alternatively comply with MSHA provisions under 30 CFR part 32 (revised as of July 1, 1996) (formerly Schedule 24), or be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and be operated in accordance with that part.

(11) For purposes of subrules (9) and (10) of this rule, when an applicable MSHA provision uses the term “mine,” use the phrase “underground construction site.” (Each brake horsepower of a diesel engine requires at least 100 cubic feet (2.832 m³) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

~~(10)~~**(12) Fire-resistant hydraulic fluids shall be used in hydraulically-actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher or fire extinguishers of sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:40B:C.**

~~(11)~~**(13) A noncombustible barrier shall be installed below welding or burning operations.**

~~(12)~~**(14) In an underground operation, local gas checks shall be made before and during a welding or cutting operation and during a drilling operation that would penetrate the tunnel.**

~~(13)~~**(15) Whenever 5% or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area or in the air return, an employer shall take steps to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below 5% of the lower explosive limit, but shall be reinstated whenever the 5% level is exceeded.**

~~(14)~~**(16) Whenever 10% or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, such work shall be suspended until the concentration of such flammable gas is reduced to less than 10% of the lower explosive limit.**

~~(15)~~**(17) A fire watch shall be maintained around welding and cutting operations until all possibility of fire is eliminated. The fire watch shall be provided with a minimum of 1 approved 2A-10BC fire extinguisher.**

~~(16)~~**(18) Flammable materials or supplies, other than those used during 1 shift, shall not be stored within 100 feet (30.48 meters) of any tunnel or shaft opening. If this is not feasible because of space limitations on the jobsite, then such materials may be located within the 100 foot limit, if both of the following provisions are complied with:**

(a) The materials are located as far as practicable from the opening.

(b) A fire resistant barrier of not less than a 1-hour rating is placed between the stored material and the opening or additional precautions are taken that will protect the materials from ignition sources.

R 408.41475a Hoisting unique to underground construction.

Rule 1475a. Except as modified by this standard, employers shall comply with all of the following:

(a) The requirements of Construction Safety **and Health** Standard Part 10. "~~Lifting and Digging Equipment~~**Cranes and Derricks**," as referenced in R 408.41410, ~~except that the limitation in R 408.41021a does not apply to routine access of employees to an underground worksite via a shaft.~~

(b) Ensure that material hoists comply with ~~R 408.41065a, R 408.41070b, R 408.41074a, and R 408.41075a~~ of Construction Safety **and Health** Standard Part 10. "~~Lifting and Digging Equipment~~**Cranes and Derricks**," as referenced in R 408.41410.

(c) Ensure that personnel hoists comply with the personnel hoists requirements of ~~R 408.41065a, R 408.41072a, R 408.41074a, and R 408.41075a~~ and the elevator requirements of ~~R 408.41065a, R 408.41074a, and R 408.41075a~~ of Construction Safety **and Health** Standard Part 10. "~~Lifting and Digging Equipment~~**Cranes and Derricks**," as referenced in R 408.41410.

R 408.41477 Additional requirements for hoists.

Rule 1477. (1) A hoist used for raising or lowering materials in a shaft shall have a minimum factor of safety of 5, shall be designed and rated by a qualified engineer, and shall be constructed in accordance with the design. The design shall be constructed so that the hoist cannot exceed the maximum rated speed.

(2) The rated capacity of the hoist shall be posted at all working levels.

(3) To ensure suitable operation and safe condition of all functions and safety devices, each hoist assembly shall be inspected and load-tested to 100% of its rated capacity at the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. The employer shall prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file until completion of the project.

(4) A competent person designated by the employer shall visually inspect the stationary hoist assembly, anchorages, and hoisting rope at the beginning of each shift.

(5) All unsafe conditions that are revealed by tests, checks, or inspections shall be corrected before use of the equipment.

(6) Hoist equipment and the operator shall be protected from inclement weather by a hoist house with a comfortable temperature maintained.

(7) Where glass is used in hoist house windows, the glass shall be safety glass or its equivalent.

(8) Hoist controls shall be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(9) Controls for powered hoists shall be of the deadman-type with a non-locking switch or control.

(10) All hoists shall be equipped with landing level indicators at the operator's station. Marking the hoist rope does not satisfy this requirement.

(11) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(12) Personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) shall not be hoisted together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(13) Line speed shall not exceed the design limitations of the systems.

(14) A fire extinguisher that is rated at least 2A:10B:C, multi-purpose, dry chemical, shall be mounted in each hoist house.

(15) Hoists shall be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(16) Hoist operators shall be provided with a closed-circuit voice communication system to each landing station, with speaker microphones located so that the operator can communicate with individual landing stations during hoist use.

(17) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions shall be guided by fenders, rails, ropes, or a combination of those means.

(18) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets shall be rope or rail guided to within a rail length from the sinking operation.

(19) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, shall be rope or rail-guided for the full length of their travel.

(20) Wire rope used in load lines of material hoists shall be capable of supporting, without failure, at least 5 times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to ~~R 408.41072a(14)(d)~~ of Construction Safety **and Health** Standard Part 10. "~~Lifting and Digging Equipment~~**Cranes and Derricks**," as referenced in R 408.41410, for design factors for wire rope used in personnel hoists. The design factor shall be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

R 408.41478 Additional requirements for personnel hoists.

Rule 1478. (1) A personnel hoist shall be used to raise or lower an employee in a tunnel shaft or caisson. A crane may be used to raise or lower an employee, if the crane and the work platform are as prescribed in Construction Safety **and Health** Standard Part 10. "~~Lifting and Digging Equipment~~**Cranes and Derricks**," as referenced in R 408.41410. The hoist shall comply with 1967 PA 227, MCL 408.801 to 408.824, and the elevator safety rules of the Bureau of Construction Codes, Elevator Safety Board, ~~R 408.8511 to R 408.8524~~**R 408.7001 to R 408.8695** as referenced in R 408.41410.

(2) All sides of personnel cages shall be enclosed by 1/2-inch (12.70 mm) wire mesh, at least no. 14 gauge or its equivalent, to a height of at least 6 feet (1.83 m). When

the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion. All personnel cages shall be provided with a positive-locking door that only opens inward.

(3) Flammable or combustible liquids or gases shall not be permitted on the work platform if the platform is occupied by an employee or employees.

(4) Hoist drum systems shall be equipped with at least 2 means of stopping the load, each of which shall be capable of stopping and holding 150 % of the hoist's rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping.

(5) The operator shall remain within sight and sound of the signals at the operator's station.

(6) All personnel cages shall be provided with a protective canopy. The canopy shall be made of steel plate, at least 3/16-inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy shall be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy shall cover the top in such a manner as to protect those inside from objects falling in the shaft.

(7) Personnel platforms operating on guide rails or guide ropes shall be equipped with broken-rope safety devices, safety catches or arrestment devices that will stop and hold 150 % of the weight of the personnel platform and its maximum rated load.

(8) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform shall not exceed 200 feet (60.96 m) per minute. Governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

(9) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(10) The personnel platform may travel at rated speeds greater than 600 feet (182.88m) per minute in completed shafts.